

Claims

What is claimed is:

1. Casting procedure, particularly for engine cylinder heads, comprising the steps of:
 - 5 -providing for a mold having open feeding risers for feeding the casting as the cooled metal shrinks and for attracting any slag, fumes and gases contained in the molten metal;
 - forcing molten metal to flow into the mold from a
10 furnace situated below said mold by exerting a pressure on the surface of said molten metal; and
 - sealing the top of the mold, at least at the level of the open risers, using a plate which prevent the molten metal introduced under pressure from overflowing and
15 which is connected to a vacuum device for vacuuming fumes and gases.
2. Casting procedure in accordance with claim 1, in which the expulsion of the casting from the mold takes place below it.
- 20 3. Casting procedure in accordance claim 2, in which at least the upper part of the figure of the casting is obtained using cores.
4. Casting procedure in accordance with claim 2, in which at least the upper part of the figure of the casting is
25 obtained using a metal cope.

5. Casting machine for receiving a mold, where the mold is equipped with a bottom and an ejector plate extending downwards from said bottom, the casting machine comprising a lower main structure (30) suitable for housing a holding or maintenance furnace (32) for feeding the mold in a low-pressure casting procedure or in a casting procedure according to any one of the preceeding claims, an upper main structure (31) resting on said lower structure, a base plate (29) resting on the upper main structure (31), a cooled plate (16) positioned on the base plate (19) and suitable for receiving the bottom (35) of the mold, characterised in that it further comprises, underneath the cooled plate (16), a plate holder (17) to be fastened to the ejectors plate of the mold and running vertically between an inactive lowered position and a raised casting expulsion position.

6. Casting machine according to claim 5, wherein the cooled plate (16) is fitted with an opening (16') for passage of the ejectors plate (38).

20 7. Casting machine according to claims 6, comprising quick lock means for fastening together the ejectors plate (38) of the mold and the plate holder (17) of the casting machine.

8. Casting machine according to claim 7, in which the mold ejectors plate has a pair of mushrooms (39) and in

which the plate holder of the machine is provided with a slide (19) which runs along the plate holder and has slots adapted to receive the mushrooms and to lock them in place following the movement of the slide controlled
5 by a hydraulic cylinder (21).

9. Casting machine according to claim 5, especially for engine cylinders heads, destined to receive a mold with two sides, comprising two sides carriers (1) which are fixed to the corresponding side of the mold and slide
10 along guide columns (5) and sliding gibs (20) fitted to the machine for a movement of the slides by hydraulic cylinders (4).

10. Casting machine according to claim 9, in which the sides are fastened to the sides carriers by automatic
15 quick locking devices.

11. Casting machine according to claim 10, in which every sides carriers has a slide (24) with slots to receive a pair of mushrooms which protrude from the side of the mold and lock them in place following the movement of the
20 slide controlled by a hydraulic cylinder (25).

12. Casting machine according to claim 11, in which the sides carriers (1) are hinged to the sides of the machine, making it possible to rotate then upwards by means of oscillating hydraulic cylinders (7) fitted to
25 the machine to enable easy cleaning and repainting of

the figure parts of the sides of the molds.

13. Casting machine according to claim 9, in which at least one side of the mold is made in at least two overlapping parts and in which the related side carrier
5 is made up of at least two corresponding parts, each of which is moved by a hydraulic cylinder (4), said hydraulic cylinder being controllable independently or in parallel.

14. Casting machine, especially for engine cylinders
10 heads, with a tilting arm (8) hinged to the top, destined for the movement of a metal male for low-pressure casting or a casting according to claim 1 to 5, and/or for the movement of sealing means for the upper part of a mold positioned on the machine, depending on the casting
15 process used.

15. Casting machine according to claim 14, in which the metal male and/or the sealing means of the upper part of the mold are attached to a hydraulic cylinder (10) carried by the tilting arm for their vertical movement.

20 16. Casting machine according to claim 14, in which, during the casting process, the tilting arm is closed on the bench and locked to the latter from the opposite side compared with the hinged side by a locking device, such as a jack (28').

25 17. Casting machine according to claim 5, wherein the

main lower structure (30) is removable from the upper structure (31) for placing said upper structure on a carrousel or on the ground for a gravity casting procedure.

- 5 **18.** Mold for obtaining castings, especially engine cylinders heads, comprising a bottom (35) and an upper part obtained through cores or a metal male, characterized by the fact that said bottom is provided with inlets (36) for coupling to pipes from a furnace
- 10 placed underneath the mold and containing the molten metal and by the fact that in said cores or in said metal male open feeding risers are provided for feeding the casting as the cooled metal shrinks and for attracting any slag, fumes and gases contained in the molten metal.
- 15 **19.** Mold according to claim 18, in which the upper part of the figure is obtained by cores, comprising a plate (45) destined to be pressed, during the casting phase, onto the upper surface of the mold to prevent the molten metal from overflowing through the risers.
- 20 **20.** Mold according to claim 18, in which the upper part of the figure is obtained by the metal male (51) and in which the male is fastened to a plate (45') destined to be pressed, during the casting phase, onto the upper surface of the mold to prevent the molten metal from
- 25 overflowing through the risers.

21. Mold according to claim 19, in which the plate is crossed by channels for the vacuuming of fumes and gases from the mold and is fastened to a support (46) in which there is a vacuum chamber (46'') communicating with an external vacuum device, said plate's vacuum channels being provided with filters to prevent the passage of molten metal.

22. Mold for obtaining castings, especially engine cylinders heads, using a low-pressure casting procedure, where the upper part of the figure is defined by a metal male (52), characterized by the fact that said metal male is crossed by channels (52') for the vacuuming of fumes and gases from the mold and is fastened to a support (46) in which there is a vacuum chamber (46'') communicating with an external vacuum device, said metal male's vacuum channels being provided with filters to prevent the passage of molten metal.

23. Mold according to claim 22, in which only the plate or the support with the vacuum chamber are jointed to the hydraulic cylinder (10) carried by the tilting arm (8) on the casting machine according to any of the claims from 14 to 17.